<u>Amendments to the Claims:</u>

Please amend the claims as follows:

1. (Original) A method of optical communication, comprising the steps of:

providing a quadrature modulated optical data signal, the optical data signal including two data bands separated in frequency, each data band having in-phase and quadrature components;

during transitional states of the quadrature modulated optical data signal in which data symbols change in value, reducing the power to zero such that transmitted power decreases to zero at approximately a mid point of the transitional states;

combining the optical data signal with a side carrier at a single frequency between the two data bands of the optical data signal;

transmitting the combined optical data signal;

receiving the combined optical data signal;

separating the side carrier from the two data bands of the combined optical data signal;

increasing an amplitude of the side carrier;

modulating the side carrier into two shifted side carriers, one of the two shifted carriers being shifted in frequency to the middle of each of the respective two data bands; and

correcting for polarization mode dispersion on the combined signal by adjusting a polarization state of each of the two shifted side carriers to match a polarization state of the one of the two data bands at which the respective shifted side carrier is centered.

2. (Original) The method of claim 1, further comprising the steps of:

separating the in-phase and quadrature components of the two data bands after optoelectric conversion; and

after optoelectric conversion, compensating for chromatic dispersion by applying a corrective function to each of the in-phase and quadrature components of the data bands, the corrective function precisely counteracting the effects of chromatic dispersion on the in-phase and quadrature components.

3. (Original) The method of claim 1, further comprising the steps of:

before transmission, separating signals in quadrature in each of the two data bands of the combined optical data signal into separate first and second signals; and

inputting the first and second signals into respective first and second channels of a dense wave division multiplexer.

4. (Original) The method of claim 1, further comprising the step of:

before transmission, reducing an amplitude of the side carrier.

5. (Original) The method of claim 1, wherein the step of compensating for polarization mode dispersion on the combined signal includes the steps of:

mixing the optical data signal with one of the two shifted side carriers, the shifted side carrier having a second polarization state;

adjusting the second polarization state of the shifted side carrier;

determining, through feedback from the mixing step, whether the adjustment to the second polarization state of the carrier signal has brought the second polarization state in alignment with the first polarization state; and

repeating the previous steps until the second polarization state is in alignment with the first polarization state.

6. (Currently Amended) The method of claim 1, wherein the step of compensating for polarization mode dispersion on the combined signal includes the steps of:

mixing the optical data signal with one of the two data bands of the optical data signal, the one of the two data bands having a first polarization state;

adjusting the first polarization state of the one of the two data bands;

determining, through feedback from the mixing step, whether the ~~adjustmnet~~ adjustment to the first polarization state of the one of the two data bands has brought the first polarization state in ~~alighment~~ alignment with the second polarization state; and

repeating the previous step until the first polarization state is in alignment with the second polarization state.

7. (Original) The method of claim 3, further comprising the steps of:

during modulation, imprinting a first data signal in-phase and a second data signal in quadrature phase onto two data channels on data bands of a first quadrature modulated optical data signal;

during modulation, imprinting a third data signal in-phase and a fourth data signal in quadrature-phase onto each of two data channels on data bands of a second quadrature modulated optical data signal;

encoding the first modulated optical data signal with a first polarization state; and

encoding the second modulated optical data signal with a second polarization state.

8. (Original) The method of claim 7, further comprising the steps of:

combining the first and second quadrature modulated optical data signals;

separating the first and second quadrature modulated optical data signals according to polarization state, the first and second data channels in the data bands having a first polarization state, the third and fourth data channels in the data bands having a second polarization state;

before transmission, filtering the separated signals according to frequency.

9. (Original) The method of claim 1, wherein after reception, the side carrier is separated from the two data bands of the combined optical data signal by filtering the combined optical signal using a Fabry-Perot resonator.

10. (Original) The method of claim 1, further comprising the step of:
prior to transmission, modulating the side carrier with an identification code, the identification code including information concerning a transmitter performing the step of transmitting the combined optical data signal.

11. (Original) The method of claim 10, further comprising the steps of:

separating the in-phase and quadrature components of the two data bands after optoelectric conversion; and

compensating for chromatic dispersion by applying a corrective function to each of the in-phase and quadrature components of the data bands, the corrective function precisely counteracting effects of chromatic dispersion on the in-phase and quadrature components;

wherein the information concerning a transmitter includes parameters used in the corrective function to precisely counteract the effects of chromatic dispersion.

12. (Previously Presented) A method of reducing the transmitted power of a quadrature modulated optical data signal, comprising the steps of:

providing a quadrature modulated optical data signal; and

during all transitional states of the quadrature modulated optical data signal in which data symbols can change in value, reducing the power to zero such that transmitted power decreases to zero at approximately a mid point of each of the transitional states.

13. (Previously Presented) The method of claim 12, further comprising the steps of:

combining the quadrature modulated optical data signal with a side carrier; and

transmitting the side carrier with the quadrature modulated optical data signal.

14-23 (Canceled).

24. (Previously Presented) An optical data signal transmitter comprising:

a Mach-Zender modulator, the Mach-Zender modulator receiving an input optical signal and modulating a pair of side carriers onto the input optical signal, outputting an optical carrier signal; and

at least two phase modulators, the at least two phase modulators receiving the optical carrier signal and each generating an optical data signal by modulating a pair of data signals onto at least two data bands;

wherein the data bands are spread in frequency when modulated onto the optical carrier signal, the spreading causing an amplitude of the optical data signal to be reduced to zero during all transitional states between any pair of data symbols, in which the data symbols can change in value.

25. (Previously Presented) An optical data signal transmitter comprising:

a Mach-Zender modulator, the Mach-Zender modulator receiving an input optical signal and modulating a pair of side carriers onto the input optical signal, outputting an optical carrier signal;

at least two phase modulators, the at least two phase modulators receiving the optical carrier signal and each generating an optical data signal by modulating a pair of data signals onto at least two data bands;

a second Mach-Zender modulator, the second Mach-Zender modulator imprinting the input optical signal with an identification code to generate a TX ID, the identification code including information concerning the transmitter; and

a combiner, the combiner attaching the TX ID to the optical data signal;

wherein the data bands are spread in frequency when modulated onto the optical carrier signal, the spreading causing an amplitude of the optical data signal to be reduced to zero during transitions between data symbols.

26. (Original) The transmitter of claim 25, further comprising:

a polarization transformer;

wherein the at least two phase modulators generate a first optical data signal including data bands imprinted with a first pair of data channels, the first optical data signal having a first polarization state, and a second optical data signal including data bands imprinted with a second pair of data channels, the second optical data signal having a first polarization state, the polarization transformer altering a polarization state of the first optical data signal from the first polarization state to a second polarization state.

27. (Original) The transmitter of claim 26, further comprising

a dense wave division multiplexing unit; and

means for separating the first pair of data channels from the second pair of data channels based upon differing polarization states of the first and second optical data signals;

wherein the first and second pairs of data channels are input to separate channels of the dense wave division multiplexing unit.

28. (Currently Amended) An optical data signal comprising:

a Mach-Zender modulator, the Mach-Zender modulator receiving an input optical signal and modulating a pair of side carriers onto the input optical signal, outputting an optical carrier signal; and

at least two phase modulators, the at least two phase modulators receiving the optical carrier signal and each generating an optical data signal by modulating a pair of data signals onto at least two data bands;

wherein the data bands are spread in frequency when modulated onto the optical carrier signal, the spreading causing an amplitude of the optical data signal to be reduced to zero during transitions between data symbols; and

wherein the pair of side carriers is modulated onto the input optical signal at both above [[an]]<u>and</u> below a reference frequency of the input optical signal.

29. (Original) The transmitter of claim 28, wherein a first side carrier of the pair of side carriers is modulated onto the input optical signal at 30 Ghz above and below the reference frequency, and a second side carrier of the pair of side carriers is modulated onto the input optical signal at 20 Ghz above and below the reference frequency.

30-50. (Canceled)

51. (Previously Presented) The method of claim 12, further including spreading orthogonal data signals onto two side carriers of an optical signal to obtain the quadrature modulated optical data signal.

52. (Previously Presented) The method of claim 51, wherein the two side carriers are separated from one another by a clock rate.

53. (New) The method of claim 12, wherein the transmitted power is independent of a data pattern of the quadrature modulate optical data signal.